EPS and LAM-EPS applications

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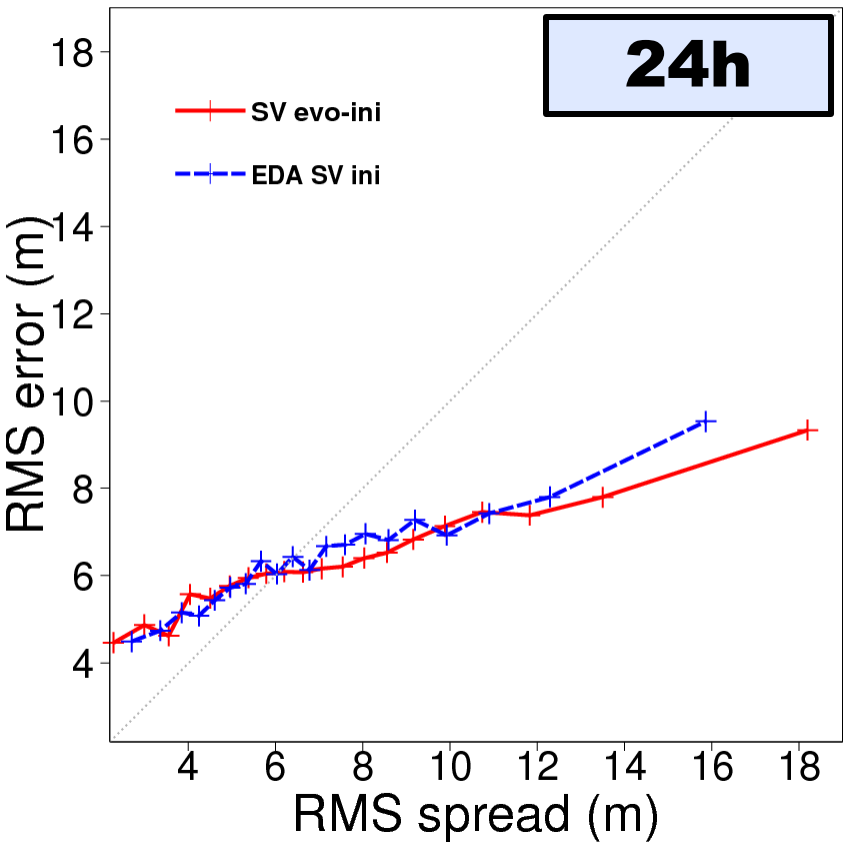
New EPS initial perturbations

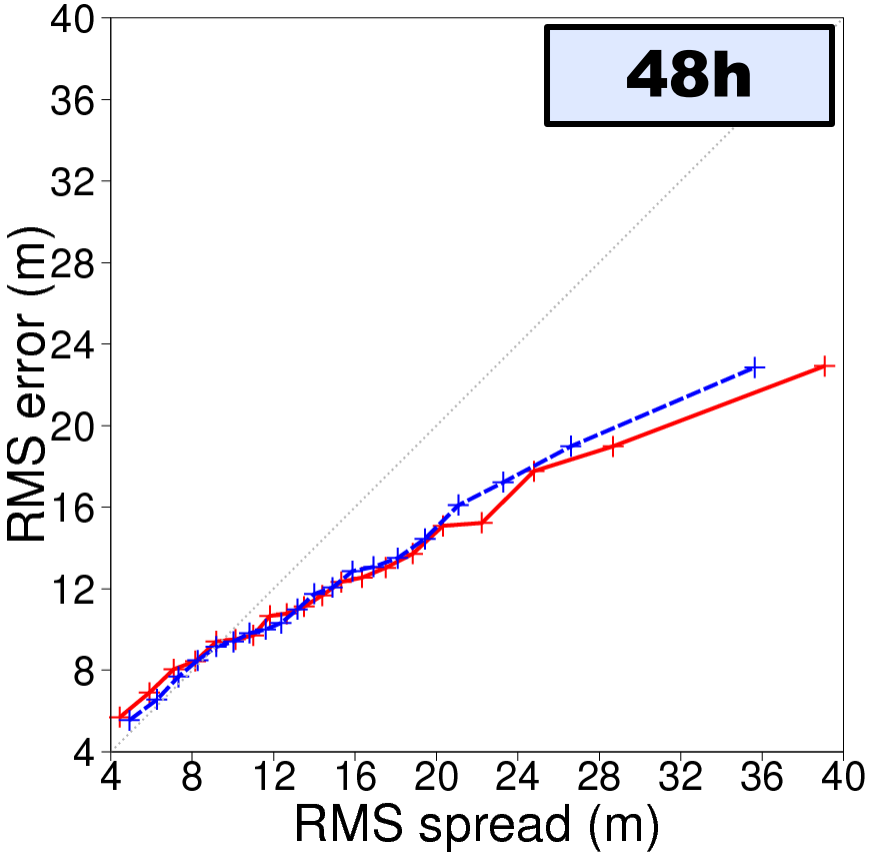
22nd June 2010: Implementation of IFS cycle 36r2 will bring an improved representation of initial uncertainty

~~evolved SVs~~ → EDA (Ensemble of 4D-Var) perturbations

- **EDA: 10 members, T_L399 with perturbed observations, perturbed tendencies (SPPT), perturbed SST.**
- **EDA quantifies analysis uncertainty. In theory, provides sample from distribution of initial uncertainty.**
- **EDA is required to provide flow-dependent estimates of background error variance for 4D-Var**
- **EDA perturbations should improve skill of LAM ensembles that use EPS for providing ICs/BCs**
- **EPS e-suite data, including model levels, is available for testing (but not archived in MARS)**

Predicting uncertainty over Europe: 500 hPa geopotential

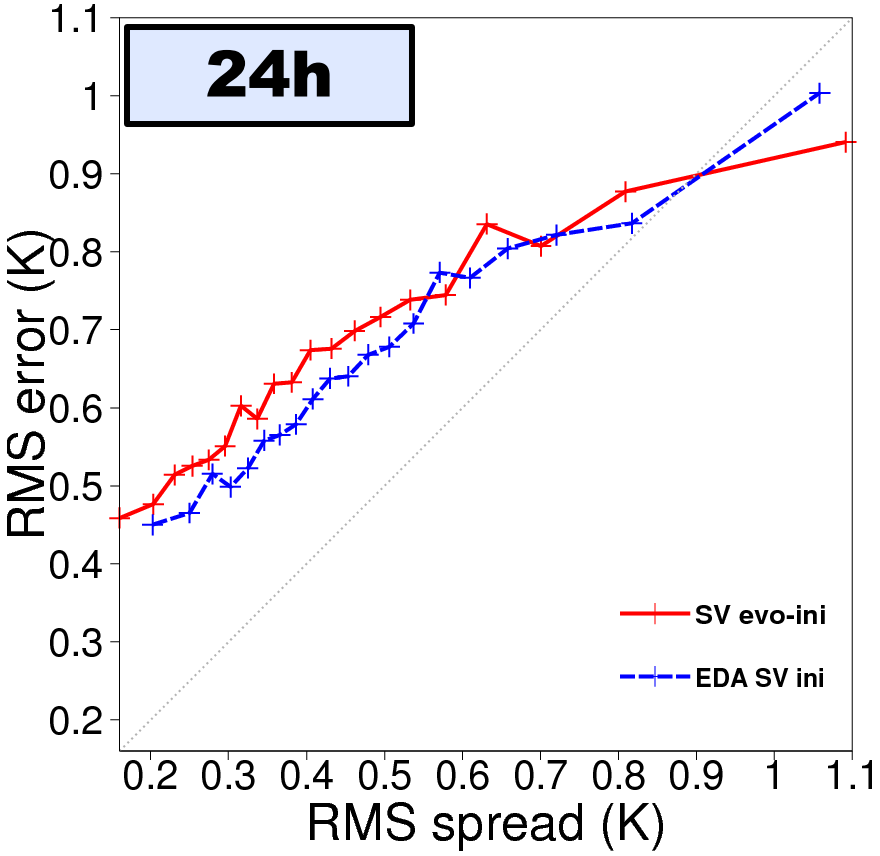


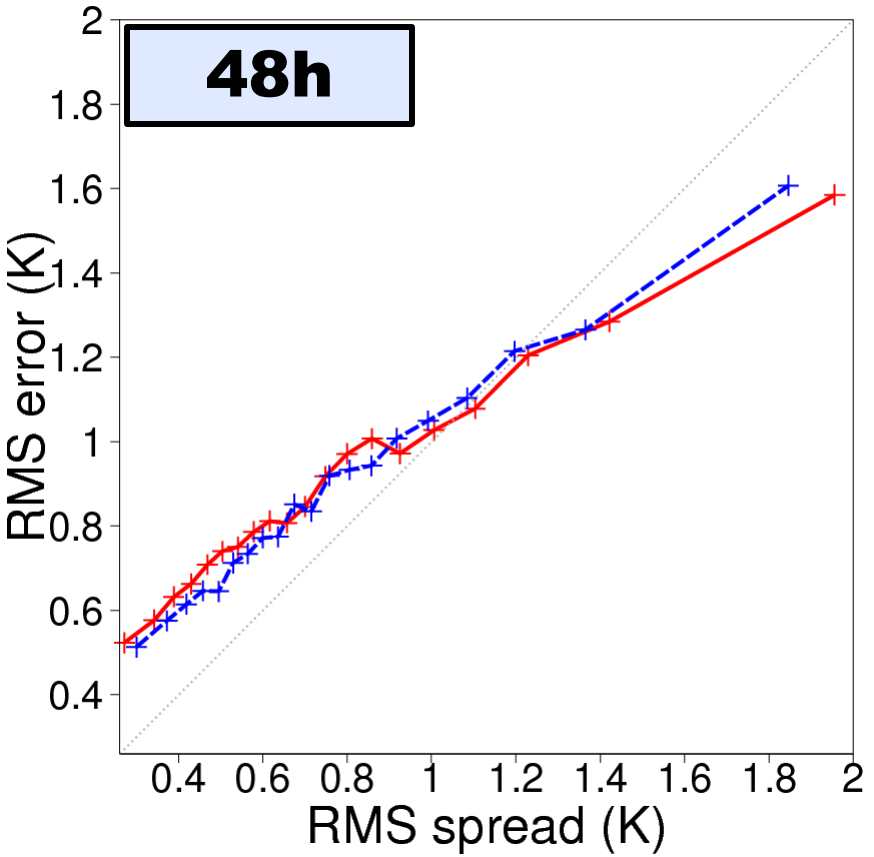


Spread-reliability: ensemble stdev (x-axis) versus ensemble mean RMS error (y-axis). 20 equally populated bins (for more background info see my presentation and proceedings at 2009 Annual Seminar)

ECMWF

Predicting uncertainty over Europe: 850 hPa temperature





Based on 88 cases in Oct-Dec2009 with cycle 36r2, resolution T_L639 → significant improvement in predicting uncertainty in the early ranges with EDA perturbations.

ECMWF

Requirements of a global EPS for providing LAMEPS with ICs/BCs

- The EPS could be run at 18 UTC (and also 06UTC). This would permit
  - more timely LAMEPS products
  - more frequent LAMEPS updates
- Same configuration as operational EPS is desirable to avoid need for extra resources. But adapt
  - forecast length
  - number of members

  to match LAMEPS requirements
- Research in (or jointly with) LAMEPS community may lead to revised EPS configurations in the future